since they can come from taxa with low pollen production or poor pollen preservation. In combination with pollen records, its use allows the study of the individual responses of species (or groups of species closely related) across long timescales. Furthermore, they are produced and dispersed locally providing of local information and, as macrofossils can be directly radiocarbon dated, their age estimation is much precise than when assigning a date to a pollen sample. When macrofossils are used in SDMs, a much more detailed and convenient information is obtained. Macrofossils combined with pollen information, allow more precise studies of species past distributions and accordingly improve SDMs projections into past times. Therefore more macrofossil data are required not only for improving the knowledge of past vegetation at local scale, but for improving SDMs studies that try to answer biogeographical questions at larger time scales.

Assessing the effects of complexity in cross-temporal transferability of species distribution modelling predictions using palaeobotanical data

POSTER IN SESSION S30

Moreno-Amat, Elena[1] *[emorenoamat@gmail.com]; Mateo, Rubén G.* [2]*; Nieto-Lugilde, Diego*[3]*; Morueta-Holme, Naia*[4]*; Svenning, Jens-Christian*[5]*; García-Amorena, Ignacio*[1]

[1]*Departamento de Silvopascicultura, Universidad Politécnica de Madrid, Madrid (Spain)*
[2]*Institute of Environmental Sciences, University of Castilla-La Mancha, Toledo (Spain)*
[3]*Center for Environmental Science, University of Maryland, Frostburg (USA)*
[4]*Section for Ecoinformatics and Biodiversity, Aarhus University, Aarhus (Denmark)*
[5]*Section for Ecoinformatics and Biodiversity, Aarhus Universit, Aarhus (Denmark)*

Species distribution models (SDMs), statistical or other computational models describing relationships between a species' occurrences and environmental and geographical factors, are widely used for predicting the distribution of species across space and time. Properly assessing the uncertainty in such predictions is non-trivial and requires validation with independent datasets. A promising emerging approach is to validate the cross-temporal transferability of SDM predictions using palaeoecological data on past species distributions to validate predictions of models calibrated on present-day distributions. However, there is still much uncertainty associated with model calibration and validation with this kind of data. Model complexity remains an issue of major concern in relation to minimizing model under- and over-prediction. We assess the effect of model complexity on the performance of Maxent projections across time, using two widespread European woody species: *Alnus glutinosa* (L.) Gaertn. and *Corylus avellana* L., with an extensive late Quaternary fossil record as a study case in the Iberian Peninsula. Maxent is an extensively used algorithm for ecological modeling due to its good performance and its applicability to presence-only data. European current occurrences for the species were taken from the GBIF dataset, while the mid-Holocene Iberian pollen data were obtained from the European Pollen Database and the literature. Present and mid-Holocene climate data were obtained from the Worldclim database. Current models were calibrated using 70% of European occurrences randomly chosen. A non-independent validation with the remaining occurrences was made to evaluate the effects of complexity of models (number of parameters in the models) on their ability to predict current species distribution by means of the AUC (Area Under the receiver operating characteristic Curve) and Akaike Information Criterion. Models were projected to continental Spain under mid-Holocene climatic conditions and independently evaluated with palaeobotanical data by means of AUC and the correlation between pollen percentage in fossil sites and past model suitability predictions. Model performance increases with model complexity for predicting current distributions for both species, whereas the opposite trend was found when evaluating the models on the mid-Holocene distributions. Also, default Maxent settings for complexity are not optimal for modeling our species in the Iberian Peninsula across time. Instead, the best values for predicting both present and past distributions are found in models with intermediate complexity. We recommend to validate SDM projections across time when palaecological data are available, conducting species-specific model tuning to find the best modeling settings to control for complexity. As these data are scarce, we suggest producing simpler models, with an intermediate complexity, when predicting current and past distributions of species.